## CLAIMS

We claim:

1. A selectively replicating recombinant virus comprising a pathway-responsive promoter operably linked to a repressor of viral replication.
2. The vector of claim 1 wherein the pathway-responsive promoter is selected from the group consisting of a p53 pathway-responsive promoter, an Rb pathway responsive promoter and a TGF–β pathway-responsive promoter.
3. The vector of claim 2 wherein the virus is derived from the genus adenoviridiae.
4. The vector of claim 3 wherein the repressor of viral replication is E2F-RB.
5. The vector of claim 4, further comprising a transgene expression cassette.
6. The vector of claim 5, wherein the transgene expression cassette comprises a pro-apoptotic gene operably linked to a promoter.
7. The vector of claim 6 wherein the prodrug activating gene is Ad5 E3-10.5K.
8. The vector of claim 7 wherein the pathway responsive promoter is a p53 pathway responsive promoter.
9. The vector of claim 8 wherein the p53 pathway responsive promoter is p53CON.
10. The vector of claim 9 wherein the promoter component of the transgene expression cassette is a temporal promoter.
11. The vector of claim 10 wherein the temporal promoter is MLP.
12. The vector of claim 11 further comprising a deletion in the adenoviral E1a coding region so as to eliminate p300 binding.
13. The vector of claim 12 wherein the deletion in the adenoviral E1a coding region comprises a deletion of amino acids 4-25 of the E1a 289R and 243R proteins.
14. A pharmaceutical formulation comprising a selectively replicating recombinant virus comprising an pathway-responsive promoter operably linked to a repressor of viral replication and a pharmaceutically acceptable carrier.
15. The formulation of claim 14 wherein the pathway-responsive promoter is selected from the group consisting of a p53 pathway-responsive promoter, an Rb pathway responsive promoter and a TGF–β pathway-responsive promoter.

16. The formulation of claim 15 wherein the virus is derived from the genus adenoviridiae.
17. The formulation of claim 16 wherein the repressor of viral replication is E2F-RB.
18. The formulation of claim 17, further comprising a transgene expression cassette.
19. The formulation of claim 16, wherein the transgene expression cassette comprises a pro-apoptotic gene operably linked to a promoter.
20. The formulation of claim 19 wherein the pro-apoptotic gene is Ad5 E3-10.5K.
21. The formulation of claim 20 wherein the pathway responsive promoter is a p53 pathway responsive promoter.
22. The formulation of claim 21 wherein the p53 pathway responsive promoter is p53CON.
23. The formulation of claim 22 wherein the promoter component of the transgene expression cassette is a temporal promoter.
24. The formulation of claim 23 wherein the temporal promoter is MLP.
25. The formulation of claim 24 further wherein the vector further comprises a deletion in the adenoviral E1a coding region so as to eliminate p300 binding.
26. The formulation of claim 25 wherein the deletion in the adenoviral E1a coding region comprises a deletion of amino acids 4-25 of the E1a 289R and 243R proteins.
27. The formulation of claim 14, further comprising a delivery enhancing agent.
28. The formulation of claim 27 wherein the delivery enhancing agent is selected from the group consisting of detergents, alcohols, and surfactants.
29. A method of killing a cell with a pathway defect by contacting the target cell with a selectively replicating recombinant virus comprising an pathway-responsive promoter operably linked to a repressor of viral replication.
30. The method of claim 29 wherein the method is practiced *in vivo*.
31. The method of claim 30 wherein the vector is administered by intraperitoneal, intravenous or intratumoral injection.
32. The method of claim 29 wherein the method is practiced *ex vivo*.
33. The method of claim 32 wherein the method is practiced ex vivo to eliminate tumor cells from stem cell products.

34. A cell transformed with selectively replicating recombinant virus comprising an pathway-responsive promoter operably linked to a repressor of viral replication.

35. A p53 pathway-responsive promoter selected from the group consisting of p53CON and RGC.

36. A TGF–β pathway-responsive promoter selected from the group consisting of PAI and SRE.

37. A diagnostic kit of parts containing a selectively replicating virus of claim 1 further comprising a transgene expression cassette containing a reporter gene and appropriate instructions for use.

38. A method of making a selectively replicating vector of claim 1, said method comprising the steps of: :

(a) infecting a producer cell with a recombinant virus comprising a pathway specific promoter driving expression of an inhibitor of viral replication,

(b) culturing said infected producer cell under conditions so as to permit replication of the viral genome in the producer cell,

(c) harvesting and lysing the producer cells, and

(d) purifying the recombinant virus.

39. The method of claim 38 wherein the producer cell is selected from 293 cells and A549 cells.

40. The method of claim 38 wherein the purification of the virus is achieved by column chromatography.